

Brazil's Response to Lower Commodity Prices

Will Infrastructure Improvements Support Further Expansion?

By

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Overview

- **Brazil's position in the world of agriculture**
- **2014/15 Brazilian Crop Estimates**
- **Infrastructure**
- **Brazil's future**

Brazil's Current Position

- **Number one producer of:**

Sugar

Coffee

Orange juice

- **One of the top producers of:**

Soybeans

Pork

Corn

Poultry

Cotton

Fruits

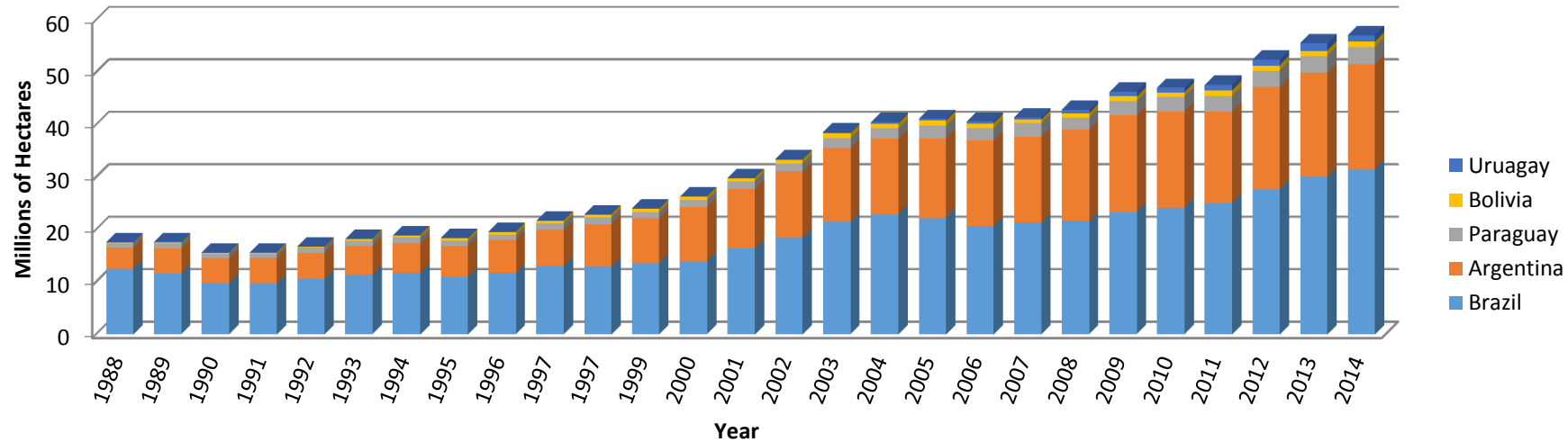
Ethanol

Tobacco

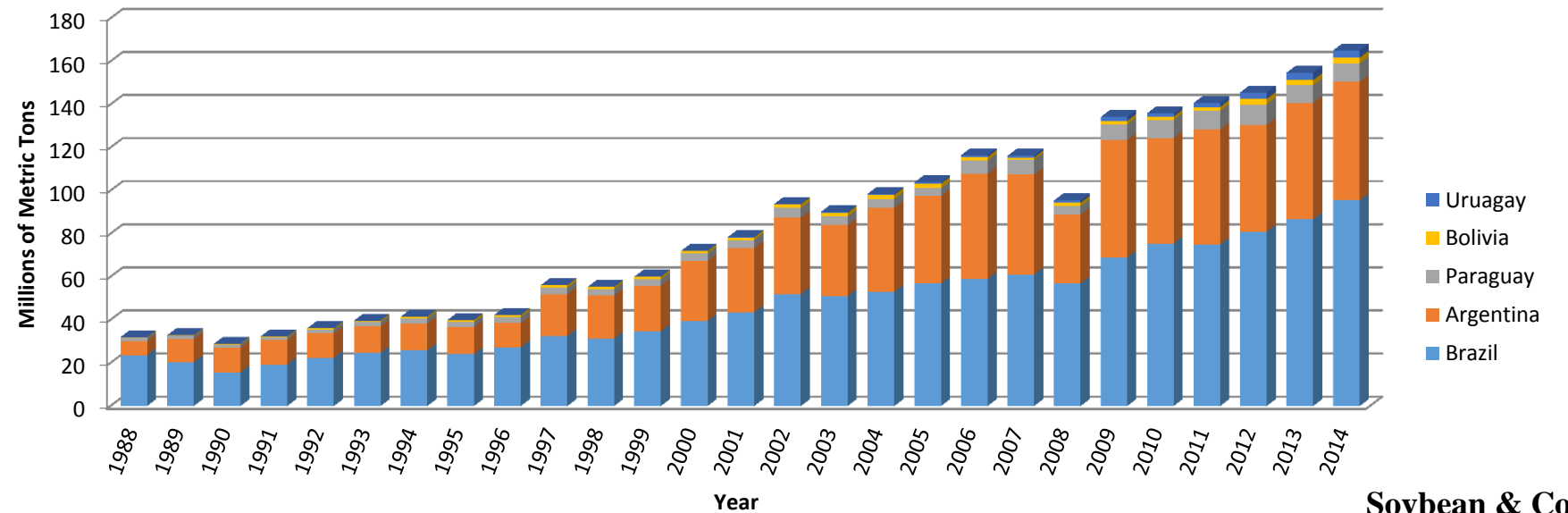
Beef

Forestry products

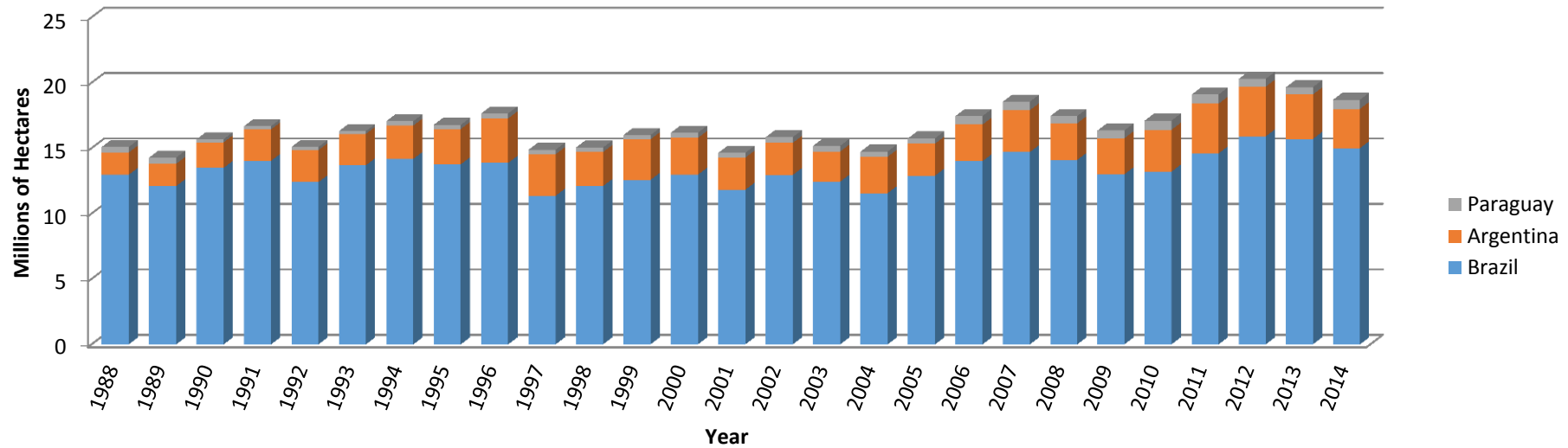
South American Soybean Acreage



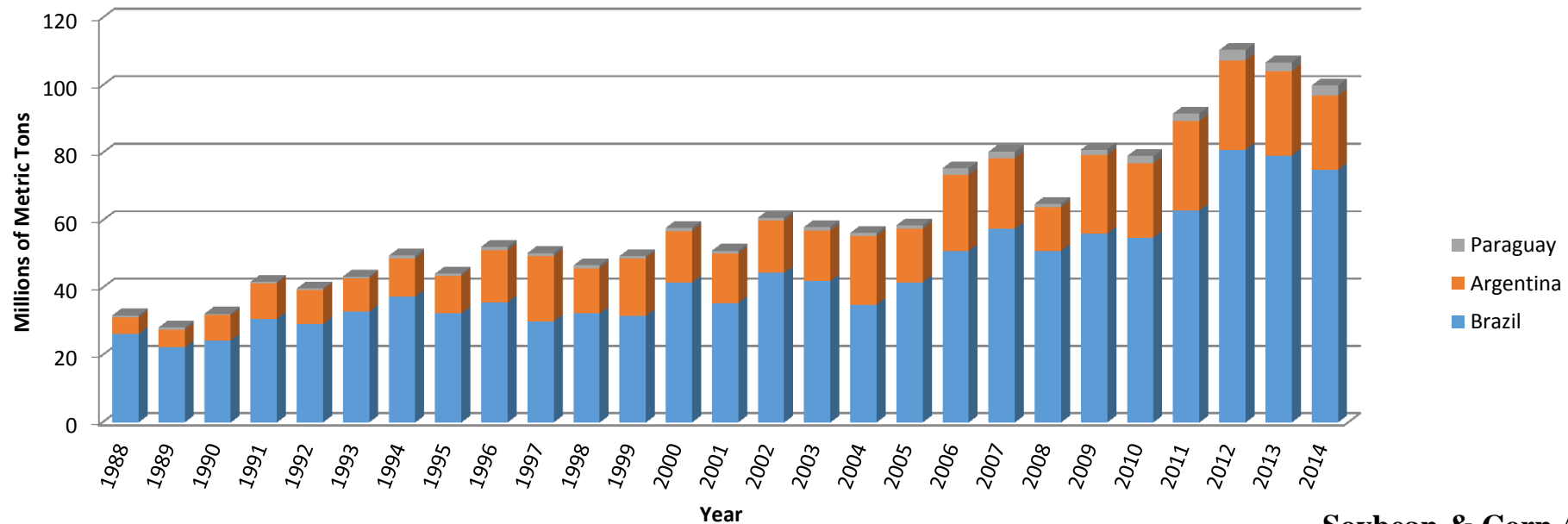
South America Soybean Production



South American Corn Acreage



South American Corn Production



Size Comparison Brazil vs. United States



Mato Grosso – Leading Soybean Producing State



Size Comparison Mato Grosso - Midwest



Brazil Soybeans

* State-Level Production
(as % of total)

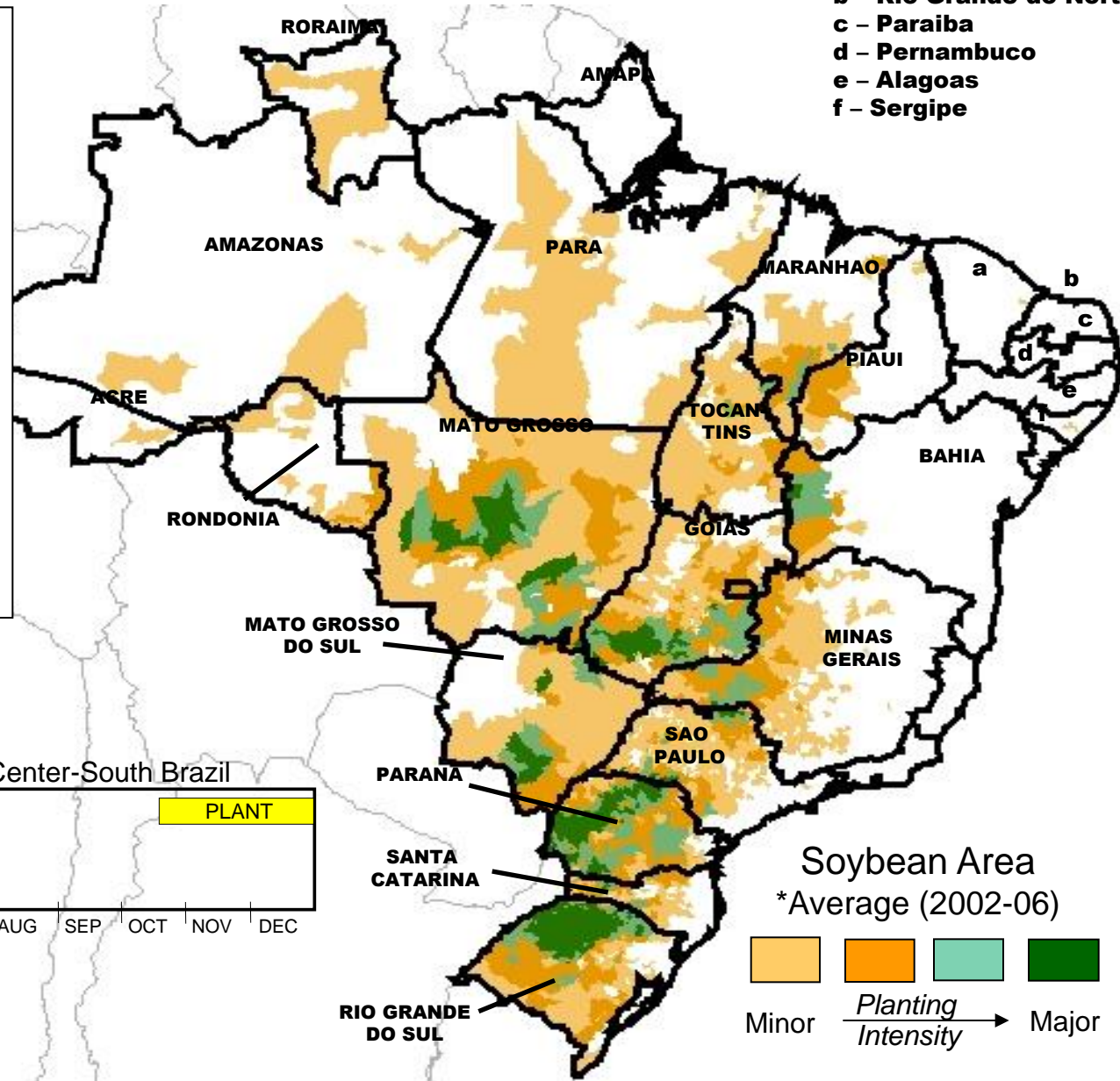
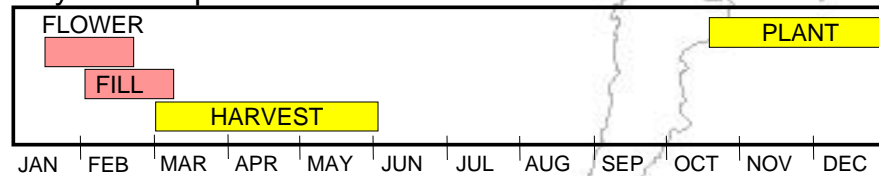
Mato Grosso	29
Parana	20
Goiias	12
Rio Grande do Sul	12
Mato Grosso do Sul	8
Minas Gerais	5
Bahia	4
Sao Paulo	3
Tocantins	2
Other	~5

* 2001/02 to 2005/06 Average

Source: IBGE Brazil

a - Ceara
b - Rio Grande do Norte
c - Paraiba
d - Pernambuco
e - Alagoas
f - Sergipe

Soybean crop calendar for most of Center-South Brazil



Soybean Area
*Average (2002-06)



*Source: IBGE

Cerrado Areas of Brazil



Native *Cerrado* Vegetation in Brazil



Native *Cerrado* Vegetation in Brazil



Brazilian *Cerrado*

203 million hectares – 24% of Brazil

- **55% of Brazil's beef production**
- **Important grain production**

Degraded Pastures

- **Low fertility**
- **Low carrying capacity**
- **Higher rates of erosion**
- **32 million hectares of pastures considered degraded**
- **80% in Mato Grosso, Mato Grosso do Sul, Goias, Minas Gerais**
- **Embrapa – triple row crop production, double cattle production using degraded pastures**

Brazil's Response to Low Commodity Prices

2014/15 Growing Season

- **More first-crop soybeans – soybean acreage up 4.4%**
 - Switching first-crop corn to soybeans
 - Conversion of degraded pastures to row crops
 - Clearing new land
- **Monocrop soybeans**
 - Virtually all of Mato Grosso's first-crop is soybeans – 8.9 million hectares of soybeans and only 61,000 hectares of corn (145 times more soybeans)
 - 90% of Parana's first-crop is soybeans
- **“Normal” crop rotations no longer viable**

Brazil's Response to Low Commodity Prices

2014/15 Brazilian growing season - soybeans

- **Dry weather in October delayed soybean planting 2-3 weeks**
- **Normal rainfall in November and December, dryer than normal in January**
- **Central Brazil received 40-60% normal January rainfall**
- **Brazil soybean estimate 93.0 million tons**
 - **New record production**
 - **Over 7 million tons more than last year's record of 86.7 million tons**
- **Soybean harvest started quickly, but now behind average pace**
- **Soybean exports slow to ramp up**
 - **U.S. exporters have several more weeks of potential exports**

Soybean Production in Mato Grosso



Maturing Soybeans in Mato Grosso



Harvesting Soybeans in Mato Grosso do Sul



Soybean Harvesting North Mato Grosso



Soybean & Corn Advisor, Inc.

Soybean Harvesting Central Mato Grosso



Brazil's Response to Low Commodity Prices

2014/15 Brazilian growing season - corn

- **Less first-crop corn – acreage down 6.5%**
- **Shifting corn production to safrinha**
- **More than 60% of Brazil's corn now safrinha production**
- **Mato Grosso number one corn producer followed by Parana**
- **Safrinha corn goes primarily to export market**
- **Safrinha corn production is risky proposition**
 - **Plant too late – dry weather in Mato Grosso cold weather in Parana**
 - **Ideal planting window in Mato Grosso closes February 20 mid-March in Parana**
 - **Last three years rainy season has been extended resulting in excellent safrinha corn production**
 - **Average yield last three years was 79.9 bu/ac, three years prior was 57.5 bu/ac**

Brazil's Response to Low Commodity Prices

2014/15 Brazilian growing season – corn

- **First-crop corn in Parana and Rio Grande do Sul developed normally**
- **First-crop corn in Minas Gerais (16% of Brazil's first-crop corn acreage) impacted by dryer than normal weather**
 - **First –crop corn production down 6.4% to 30.1 million tons**
- **Safrinha corn planted later than normal**
 - **2-3 week delay for safrinha corn planting in Mato Grosso**
 - **1-2 week delay in northern Parana**
- **Total safrinha corn acreage down 5-10%?**
- **Total safrinha corn production down 10-15%?**
- **2014/15 Brazilian corn estimate 74.0 million tons**
 - **30 million tons first crop, 44 million tons safrinha crop**

Planting *Safrinha* Corn in Brazil



Safrinha Corn Production - Mato Grosso



Safrinha Corn in Brazil – Rain Forest



Safrinha Corn Production in Brazil



Safrinha Corn Production in Mato Grosso



Will Infrastructure Improvements Support Further Expansion?

Needed infrastructure improvements

- **Highways**
- **Railroads**
- **Barging**
- **Ports**

Infrastructure Improvements Needed to Support Further Expansion

Current Situation

- **58% of Brazil's grain moved by truck over long distances**
- **25% of Brazil's grain moved by rail**
- **13% of Brazil's grain moved by barge**

The distance from Sorriso, Mato Grosso to the Port of Paranagua equal to the distance from Minneapolis, MN to Orlando, FL

Loss of US\$ 70 per ton due to truck transport

Cost of rail transport slightly less than truck transport – lack of competition

Brazil invests 0.65% of GDP in infrastructure (2004-11), China 7.3%

Infrastructure Improvements Needed to Support Further Expansion

Highways

BR-163 - the “Soybean Highway” in Mato Grosso

- **“Spine” of the infrastructure in the center-west region**
- **Currently being asphalted from Mato Grosso to Amazon River port city of Santarem**
- **Lack 300 kilometers of asphalt and numerous bridges**
- **Complete sometime in 2016**
- **800 kilometers within Mato Grosso expanding from 2-lanes to 4-lanes**
- **Major highways being converted into toll roads**

Waiting to Transport Soybeans



BR-163 Mato Grosso



BR-163 Mato Grosso



Traffic on BR-163 in Mato Grosso



Traffic on BR-163 in Mato Grosso



Infrastructure Improvements Needed to Support Further Expansion

Railroads

- **Ferronorte Railroad connects Mato Grosso to Port of Santos**
 - **Extend railroad further into Mato Grosso**
 - **Three existing grain terminals**
 - **Intermodal grain terminal at Rondonopolis largest in Latin America**
 - **Usage increasing annually**
- **North South Railroad**
 - **North-South route through center of Brazil**
 - **Northern sections haul iron ore to export facilities in NE Brazil**
 - **Generally underutilized**
 - **Go slow zones due to inadequate construction**

Ferronorte Railroad in Mato Grosso



Itiquira Grain Terminal – *Ferronorte* Railroad



Ferronorte Railroad in Mato Grosso



Intermodal Grain Complex – Rondonópolis, MT



Intermodal Grain Complex – Rondonopolis, MT



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Intermodal Grain Complex – Rondonopolis, MT



Intermodal Grain Complex – Rondonopolis, MT

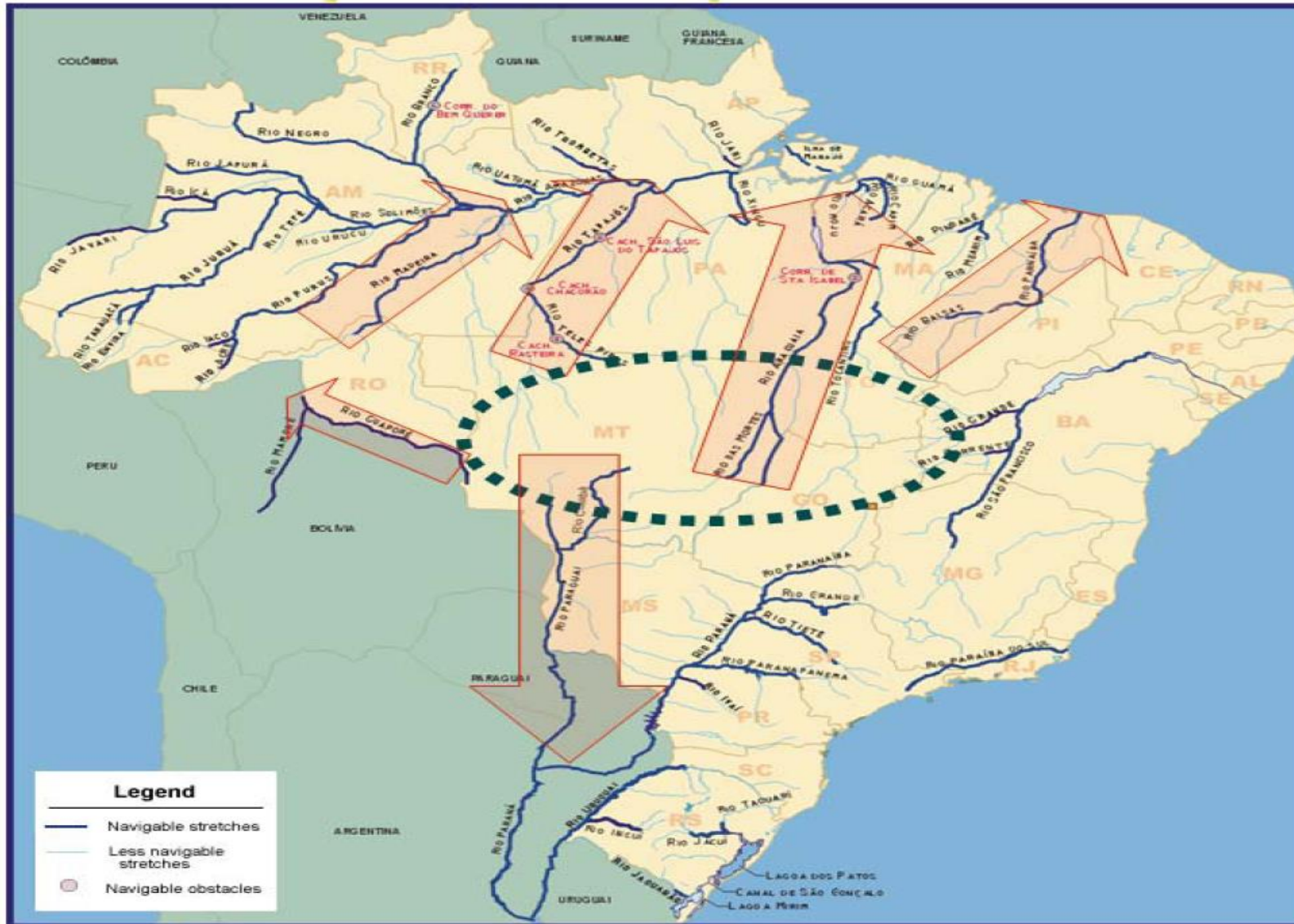


Infrastructure Improvements Needed to Support Further Expansion

Barging - Move grain north to ports on Amazon River

- **Madeira River – Porto Velho, Rondonia to Amazon River**
 - Western Brazil
 - Transport soybeans from western Mato Grosso
 - Building a second port
- **Tapajos River – Miritituba, Para to Barcarena, Para (mouth of Amazon)**
 - Central Brazil
 - Seven grain companies currently construction barging facilities,
 - Alongside of BR-163
- **Tocantins River – planning stage**
 - Eastern Brazil
- **Legislation requiring locks with new dam construction**

Brazilian River Export Routes



Barging Operations on the Madeira River

3.3 million tons - 2013



Tocantins River



Araguaia River



Infrastructure Improvements Needed to Support Further Expansion

Ports

- **Port of Santos**
 - Increased capacity
 - New scheduling system
- **Port of Paranagua**
 - 4 new shiploaders – 30% more capacity
 - “Express line” for vessels
- **“Northern Arc”**
 - Future of grain exports from Brazil
 - Itacoatiara – central Amazon, operational
 - Santarem – east-central Amazon, operational and expanding
 - Vila do Conde – eastern Amazon, operational and expanding
 - Sao Luis ocean port in northern Brazil, operational and expanding

Ports of Brazil



Port of Santos



Port of Santos



Port of Paranaguá



Shiploaders at Port of Paranagua

Foto: Fábio Scremim/APPA



Port of Itacoatiara on the Amazon River

1.8 million ton capacity - 2013



Port of Santarem on the Amazon River

1.5 million ton capacity - 2013



Port of Vila do Conde on the Amazon River

1.0 million ton capacity - 2014



Ocean Port of Itaqui, Sao Luis, Maranhao

5 million ton capacity –first phase



Infrastructure Improvements Needed to Support Further Expansion

- **First concerted effort to improve Brazil's infrastructure**
- **Highways, railroads, barges, ports**
- **“Northern Arc” of ports most significant development**
- **Four ports currently handle 77% of Brazil's soybean exports**
 - **Santos, Paranagua, Rio Grande, and Sao Francisco**
- **That is about to change**
- **In the future half of Brazil's soybean exports may head north instead of south**

Will Infrastructure Improvements Support Further Expansion?

- **Answer – a qualified yes**
- **Cost savings sending soybeans north**
- **Previous soybean expansion - needed US\$ 10.50 to 11.50 per bushel on the Chicago Board of Trade**
- **Future soybean expansion – may need US\$ 9.50 to 10.50 per bushel on the Chicago Board of Trade**
- **Rate of expansion will depend on commodity prices and general economic health of Brazil**
- **Long way to go, but Brazil might be turning the corner on infrastructure development**



Brazil's Potential

- **Brazil has: available land, climate, experience, research, knowhow, and production capability to become number one commodity exporter in the world.**
- **Brazil has the potential to become number one food exporter as well.**

BR-163 Before Asphalt



BR-163 Fifteen Years After Asphalt



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